



CHEETAL

JOURNAL OF

The Wildlife Preservation Society of India

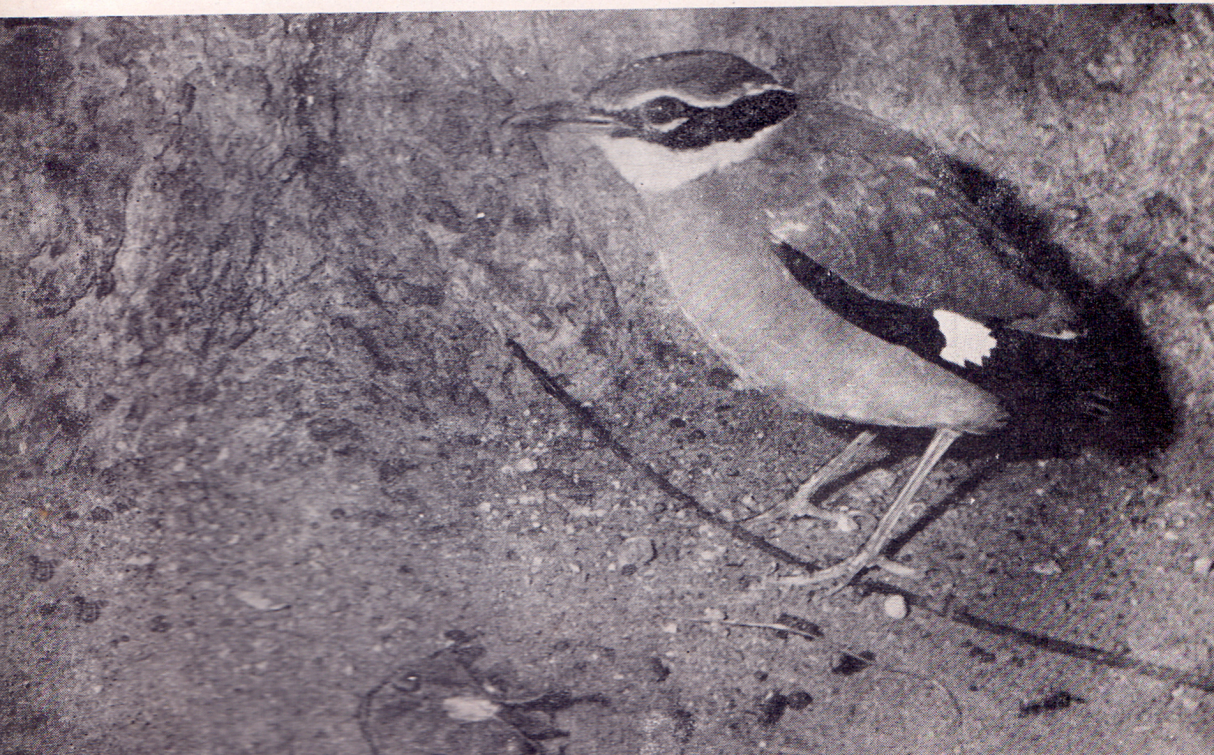
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No. 4

Indian Pitta

Photo—T.N.A. Perumal





Sambar Fawn : Defensive Behaviour, Freezing : Ranthambore Sanctuary,
Sawaimadhopur : Rajasthan.



Sambar Fawn : Compromise Behaviour : Ranthambore Sanctuary,
Sawaimadhopur : Rajasthan.

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A delegation led by Maharaja Pratap Singh Malvendra—President of Wildlife Preservation Society of India met Gyani Zail Singh, President of India and Patron-in-Chief of the Society at the Circuit House, Dehra Dun on 2nd April, 1984 and acquainted him with the present Wildlife situation in the country and the useful work the W.P.S.I. has been doing for the last twenty five years for conservation and environmental protection based on ecological principles and particularly for preserving our fast vanishing Wildlife heritage.

The President congratulated the members for useful work the Society has been doing in the field of Wildlife and nature conservation, particularly in educating the younger generation through publications, seminars, workshops and field trips. The Society publishes a quarterly bi-lingual (English/Hindi) journal—"Cheetal"—the only journal of its kind in India. Articles on Wildlife and nature conservation by knowledgeable persons, are the usual feature of the journal.

Forest Wreckers and Tree Traders

The Himalayan Forests have been subjected to an ongoing process of devastation for past many decades. The victims are the local inhabitants and Wildlife, who for thousands of years have been living in a state of ecological balance with the forest. A recently developed resistance movement with its own method of checking destructions of the forest deserves all support. Events, past and present, in the forests of the Himalayas and their consequences much further down in the plains have often been highlighted in Seminars and Workshops but need to be noticed by decision makers.

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Enough has been written about the ecological value of Kerala's Silent Valley and need not be repeated here. The Prime Minister had to intervene to save the Valley and the 850 Hectares of evergreen rain forest from drowning and more land for building a township. A demand for a revival of the project has been raised now six months after its being shelved.

Estimates of F.A.O. say that virgin evergreen forest like the Silent Valley contain up to 200 tons of hardwood per acre, which sells at Rupees two to three hundred per cubic foot in the market.

If the project is revived the reservoir itself would "Submerge" wood worth Rs. 5000 to Rs. 6000/- crores. The area would be clearfelled before being submerged. Who would gain—the Timber market barons. Who would lose—the people because of the ecological dangers inherent.

Must the project be revived? No certainly not.

Pug Mark Census

By

O. JAYARAJAN

Kerala

The Task of the Co-ordinator

41. The Co-ordinator of the census activity should be a man who has thorough knowledge about the area and who should be conversant with the behaviour of tigers and panthers of the area. This is of much importance to avoid duplication.

42. The territorial concept of tiger and panther have been studied in detail in the second half of the century only, a period when their trophic niches are confined to certain pockets only throughout India. Centripetal distribution of ungulates will converge the range of tigers also. Chotapalia area in Dudhwa National Park is an example where five adult tigers are reported to be tolerating within a extent of about 10 sq. km. A co-ordinator being a person thorough with the area can take into consideration such peculiar behaviour.

43. The difference in soil obviously gives different sizes in pug mark. But the basic shape is seldom changed unless it is a skid or after a bounce. The pug mark tracer enable the classification of pug marks mainly into 8 categories.

Classification of Pug Marks

44. The eight categories of form classified here are based on the scrutiny of 132 pug marks collected from various parts of the country. The main criteria are the position of toes and pads in different quadrants of the pug mark tracer when a pug mark is placed under the tracer as described in tracing method. The exaggeration of pug marks in the slush soil is to taken into consideration here and hence slight margin of variations in the description can be allowed while categorising. The different categories are as follows:—

(i) Pad unequally divided into two halves ranging from $\frac{3}{4}$ th to $\frac{5}{6}$ th in one quadrant and $\frac{1}{4}$ th to $\frac{1}{6}$ th in the other quadrant. 3rd and 4th toe over the 'X' axis, 2nd and 5th toe cut by X axis. Pronounced toe advance in case of 3rd and 4th toe. (Fig. 3).

(ii) Pad more or less equally halved along Y axis. 3rd and 4th toe above X axis, 2nd and 5th toe are cut, the 2nd nearer its base and 5th nearer its apex. Pronounced the advance in case of 3rd (Fig. 4).

(iii) Pad almost bisected by Y axis. 2nd, 3rd and 4th toe above X axis or the X axis cuts through almost marginally at the base of the 2nd and 4th and at the apex of the 5th toe. No pronounced toe advance (Fig. 5).

(iv) Pad divided into slightly unequal halves by Y axis. 3rd and 4th toe over the X axis. 2nd and 5th toe cut through nearer lower and upper margin respectively. No pronounced toe advance (Fig. 6).

(v) Pad almost bisected, 5th toe below and 3rd toe above X axis. Base of 2nd and 4th toe cut along 1/3rd. Almost uniform toe advance for all toes. More or less symmetrical looking paw print (Fig. 7).

(vi) Pad almost divided into 2/3rd and 1/3rd. 2nd, 4th and 5th toe cut by X axis. The 2nd and 4th toe cut along the base, 5th along its apex. Toe advanced minimum for all toes (Fig. 8).

(vii) Pad almost bisected or in 2/3rd and 1/3rd division. 2nd, 3rd and 4th toe above the X axis. 5th toe is cut apically to about 1/4th part. Toe advance for the 3rd toe is pronounced (Fig. 9).

(viii) Atypical:—The paws with pads or toes having unusual size or shape. These are forms which do not come up any regularity (Fig. 10).

The Co-ordinator amidst a collection of pug marks from various parts of his area can classify the pug marks in this way. This along with other parameters, co-related with climate and physical qualifiers will help in eliminating the error of duplication and simplify the work of the co-ordinator in a systematic manner.

The Role of Plaster Casts

45. An experiment was conducted with 24 plaster casts collected in F.R.I. Dehra Dun of tiger's and panther's pug marks. The object was to find out whether pug marks of the same animal can be differentiated by this method. The method was to apply same weight for all the casts in a tray of soil to make the impression. Pug mark tracer is used to measure the length and breadth afterwards. Two plaster casts made at Chilla Sanctuary near Forest Rest House Chilla in 1971 gave similar measurement even though one cast was from slush soil where the paw will be much exaggerated and one from normal soil. This indicates that in cases of pug marks with dubious identity, this method can be used for eliminating error. Unfortunately samples were less for this experiment and results cannot be generalised until a detailed experiment is conducted over this.

46. The pad of a cat is very soft which will give an impression like that of a rubber mould or a balloon filled with water, and not like the impression given by a solid plaster cast (Choudhary 1981 personal discussion). Since the percentage of error involved in each impression by plaster cast subjected to same pressure or weight is same, the above facts need not be taken into consideration here. Further studies on this perhaps may be interesting.

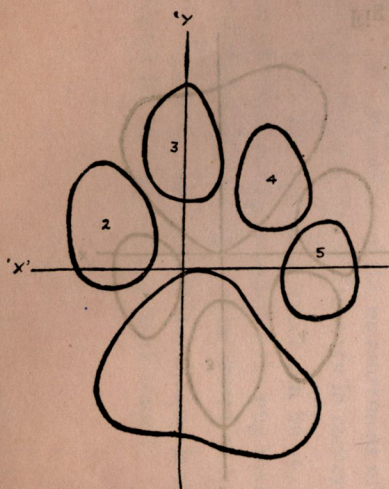


Fig. 3

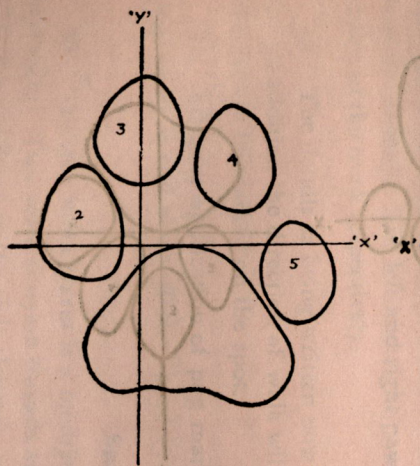


Fig. 4

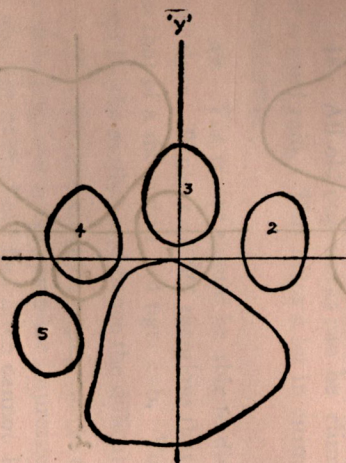


Fig. 5

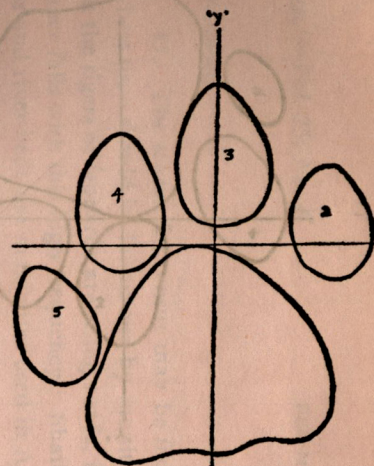
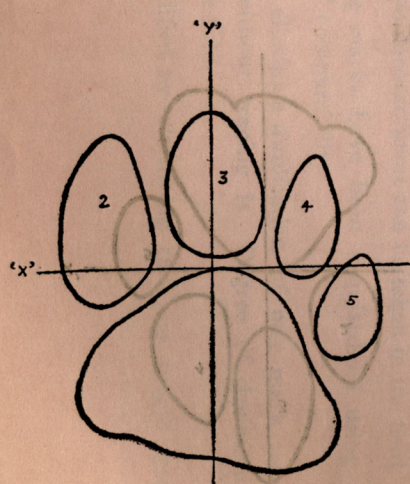


Fig. 6



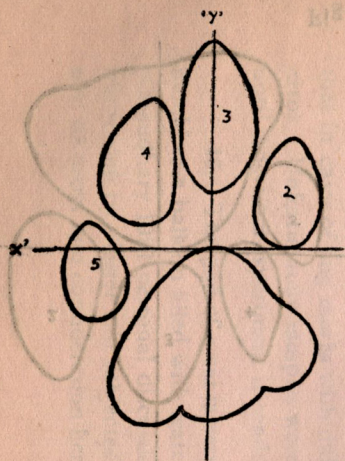


Fig 7

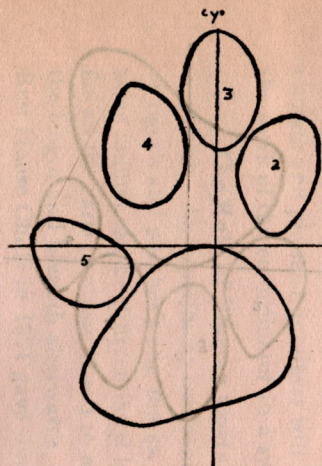


Fig 8

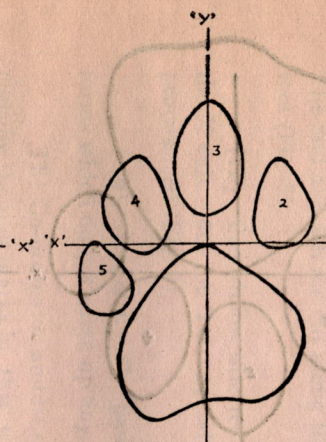


Fig 9

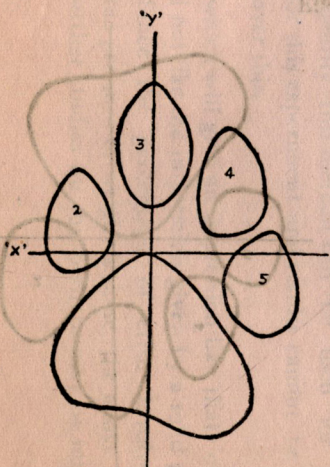


Fig. 10

Conclusion

47. The season for census may be fixed according to climatic situation of the area. The best time should be found out by monitoring of the area. There will be some season when the tigers or leopards are using roads, foot paths and nala beds frequently. In India summer falls with this high frequency. Shaik and Sawarkar (1978) mentioned that roads, nalas and river beds are maximum used in April and May.

48. All old pug marks can be eliminated if census work is done one or two days after a good rain. This helps a lot in estimating the time of walk as well as avoiding much of duplication.

49. The tracer should be able to distinguish the leopard pug mark from that of a cub of tiger. Panwar (1980) mentions that the largest leopard pug mark cannot be bigger than that of a six month old tiger cub. Young tiger cub below six months will be accompanied by the mother and hence the difficulty eliminated.

50. While tracing bear pug marks the front pug should be taken for tracing since the back paw may not leave complete impression in compact soil condition found in India. The flat sole of the hind foot often cannot leave a well defined impression (Sawarkar 1981 personal discussion). The left and right paw can be made out from the inclination towards the centre of the track respectively.

51. The details as being written now after tracing the pug mark will be recorded as usual. In addition the direction of walk will be shown in the tracing and the length and breadth should be marked on the spot.

52. Effective application of pug mark tracer with the various parameters involved provides an ideal and more effective model for pug mark census.

Summary

53. The pug mark tracer is a modified form of tiger tracer with 'Y' axis and 'X' axis marked on it. Two vertical nylon threads and two horizontal nylon threads parallel to 'Y' and 'X' axis are fitted in the slide through, so that measurement can be taken in the field.

54. Procedure of the measurement of pug marks have been standardised using the pug mark tracer which is necessary in context of comparability.

55. The pug mark tracer can be used to eliminate duplication of pug mark tracing in the field simply by measuring the pug mark without tracing it. Degree of deviation to the direction of walk also can be measured in the field.

56. The task of the Co-ordinator is simplified by classifying the pug marks into 8 different forms using the pug mark tracer.

57. Paster casts of pug marks with dubious identity can be subjected to same pressure in similar soil for impression. If similar measurements are got, it can be inferred to be the pug mark of the same animal.

58. The census model with the pug mark tracer is more effective and reliable than the existing model.

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A Note on Tortoises and Turtles of U.P. Terai in Relation to Trade

By

RAJ TILAK AND N.K. SINHA

Northern Regional Station, Zoological Survey of India, Dehra Dun (India)

During a recent visit of the authors to Filibhit (U.P. Terai), it has been observed that tortoises and turtles of the genera *Kachuga*, *Lissemys* and *Trionyx* etc. are captured from the wetlands of the region and sold in the markets in large numbers.

Uttar Pradesh Terai, as a whole, is profusely studded with wetlands of considerable importance. Because of the special type of terrain in this region and also impervious clayey soil, the water is able to stand in the wetlands without getting absorbed into the soil. The streams flowing during the rainy season also get broken up into individual ponds and marshy tracts covering an immense area in between the agricultural fields and the forests. The standing bodies of water harbour a large number of aquatic animals such as fishes, tortoises, turtles, frogs, aquatic insects, crustaceans etc. In such a habitat the tortoises and turtles find a very favourable niche for existence and they are able to breed in the proper way. The tortoises and turtles live in water for feeding but for breeding they have to depend in the dry and partly sandy banks of the rivers and the marshlands, which form common boundaries with agricultural fields and human settlements. The female digs burrows and deposits its eggs in the holes so made and before leaving the place, it covers the eggs again with earth. Due to great agricultural activity in the area, such holes are likely to be disturbed and the survival rate of young ones is tremendously reduced. Moreover, the persons engaged in clandestine trade of selling meat of tortoises and turtles in this area are aware of this type of breeding habit of these animals and they dig and remove the eggs from those holes. As a result of these activities, neither the adults nor the fertilized eggs are able to survive at the hands of these unscrupulous elements and the number of these animals is likely to go down day by day. So much so that this group of animals may at one time become threatened with extinction. The special type of marshy conditions in the U.P. Terai should be most suitable for the survival and increase in number of fresh water tortoises and turtles and if undisturbed, the area should be found teeming with these individuals, but actually the condition is just the reverse at present.

The people engaged in trade of these animals belong to a small community, recently rehabilitated in this area after they were uprooted from Bangladesh. The markets near and around such establishments only have trade in the flesh and eggs of tortoises and turtles.

The original inhabitants of the area do not like to eat the flesh of these animals due to their religious and other considerations. The trade in tortoises and turtles in U.P. Terai has started recently during the past one decade or so and in this short period, the large-sized tortoises and turtles, once freely moving in the area have vanished and even the smaller sizes are rare to find. In case the problem of poaching these reptiles is not tackled right now, it may go unabated and cause serious environmental problems in future. The authors wish to bring this fact to the notice of animal lovers, environmentalists, animal conservationists and the wildlife authorities of the State and Central Governments as a measure of awakening against unlawful trade of aquatic reptiles.

The tortoises and turtles are aquatic chelonians which differ greatly in their morphology. Among the tortoises, the carapace and the plastron are saturaly connected with one another making, a hard bony shell for enclosing the body of the animal. The limbs end in flanges which are armed with claws and help in movement on soil. The turtles on the other hand have carapace and plastron covered with soft skin and connected to one another only through cartilage or ligament. As a result, there is flexibility in the movement of carapace and the plastron against each other. The limbs in turtles end in semi paddle-shaped tips, provided with 2 to 3 claws. These flippers help them in swimming in water because turtles are better adapted to aquatic life than tortoises. In case of danger, the animal withdraws its head, the neck, the tail- the fore and hind-limbs into the shell and closes the two ends firmly. In the market, these animals are kept on the selling table with their limbs stretched out and tied firmly with one another. In this condition, they are kept upside down with carapace touching the ground. For sale of meat of these animals, they are cut into pieces alive, which is an act of extreme cruelty, presenting a dreadful and horrible sight to watch. This act of the sellers creates unfavourable impressions in the minds of local inhabitants of the area, who dislike this act but feel helpless and cannot lawfully check such an activity.

The following six species of tortoises and two species of turtles have been recorded from the area (Smith, 1931).

Tortoises

1. *Geoclemys hamiltoni* (Gray)
2. *Hardella thurgi* (Gray)
3. *Kachuga smithi* (Gray)
4. *K. tectum tectum* (Gray)
5. *K. dhongoka* (Gray)
6. *K. kachuga* (Gray)

Turtles

1. *Lissemys punctatus punctatus* (Bonnaterre)
2. *Trionyx gangeticus* (Cuvier)

During a visit to the market sites, the following tortoises and turtles were recorded selling in the market.

1. *Lissemys punctatus punctatus*
2. *Trionyx gangeticus*
3. *Kachuga* sp.

Acknowledgement

The authors are thankful to the Director, Zoological Survey of India, Calcutta for providing facilities and encouragement.

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Territorial Tenures and Predation Proportion of Tigers in Kanha National Park

By

M. RAMACHANDRAN

Indravati National Park

In any typical tiger habitat, the study of territorial occupation by Tigers is the base of tiger management. Accuracy and objectivity in such study is of paramount importance because, the inferences made therefrom will be the principles on which the whole management plan will be based. While deciding as to which area should be taken up for study the following important factors have to be considered.

- (1) It should be a natural tiger habitat.
- (2) Adequate prey density should be available.
- (3) Adequate food, water and shelter facilities should be available both for prey animals and Tigers.
- (4) The area should be subject to normal natural calamities such as seasonal drought, fire and inundation—and not a sheltered or specially favourable area.
- (5) It should be reasonably free from human disturbances and grazing.
- (6) Availability and visibility of Tigers should be adequate.

The study area in Kisli Range of Kanha National Park, fulfils all the above mentioned requirements. The approximate extent of the study area is 54 (fifty four) kilometres whose limits are noted below.

North:—Kundaghar, Kisli hill, Salghat hill.

East:—Kopedabri junction, Kudaidador, Banada bahra.

South:—Indri Forest village, Diwan bohra, Ghanghar nala.

West:—Kisli, Khatia, Budbudi nala.

The period of observation and collection of information extends from November 1978 to July 1983.

It was in the early winter of 1978 i.e. November, that the presence of a tigress with four cubs in Sandhook khol-Kherbadi area was reported. Occasional baiting was done in Sandhook khol and Kherbadi for observations. The tigress used to make kills at both these

sites and the cubs used to join her for the meal. The cubs were small in size from which their age was assessed to be 7 months. These cubs must have been born in April 1978.

The tigress appeared to be of about 8 years of age and the litter consisted of three male and one female cubs. One of the male cubs seemed to be very aggressive.

From the reports available in the past there was a big Tiger prowling the area and the tigress with the cubs wanted to be away from this dominant Tiger—probably the father of these cubs. This tigress seemed to be alternating between Sandhook khol and Kherbadi which is a better habitat from shelter point of view because there is enough cover of bamboo growth and rocky enclaves. Even though she came every evening to Sandhook khol to make kills, she was very cautious of this male because whenever the male used to make kills in Sandhook khol, she resorted to Kherbadi only.

This particular large tiger had a very vast prowling area during 1978 because the density of prey animals especially spotted deer was lesser than what it is today. It used to prowl Sandhook khol, Kherbadi, Salghat, Kopedabri and sometimes up to Indri village in the South. The Ghanghar nala anicut constructed in 1976 has considerably improved the habitat nearby by retaining much water till the end of summer. The number of prey animals has encouragingly increased since the area is of high potential. The number of main prey species during 1976 and 1983 are given below within the adjoining compartments of the anicut.

<i>Prey animal</i>	<i>No. in 1976</i>	<i>No. in 1983</i>
1. Spotted deer	67	218
2. Wild boar	90	204
3. Sambhar	36	96
4. Bison	21	38

Once the water scarcity was solved, and protection in all respects was ensured, the carrying capacity of the habitat improved beyond expectations.

Now the tigress with four cubs stayed on here throughout the summer, and they were one of the main attractions to tourists till end of June 1979. In the meanwhile the cubs also started practising predation over prey animals. Sometimes they could only trivially injure the prey while on other occasions they failed to approach and bring down tied buffaloes, bison yearlings, and wild boar. They must have experienced extreme resistance from large Sambhar antlers also. They had to fight tough with wild boars and sambhar under the supervision and support of their mother. However, spotted deer, was brought down by the cubs whenever they happened to attack, provided the ambush coverage and distance of

sudden approach was accurate. Otherwise, the slightest doubtful indication of any danger of attack made by the cubs (like slightest crushing noise of leaves or rolling of stones due to carelessness) caused the spotted deer to flee from the scene.

This process of predation training continued throughout the rainy season of 1979. The pug marks of the cubs and the tigress were seen along the roads which were observed during the field patrolling. Remnants of kills were seen in Sandhook khol, Salghat and Kopedabri. The territorial male – the father of these cubs also loitered in the same area while the tigress succeeded in training her cubs for predation and saving them from the male tiger.

It was observed that during November-December 1979 the cubs were sometimes away from the mother and away from one another. By then they were 20 months old and they were on the threshold of youth. Further they were together only to make kills and eat. Sometimes there were only two of them at kills while the other two made kills at a different place. This was evident from the pug marks.

Since the cubs had grown, and it was time for their territorial settlement, for study purposes it was essential to identify them and record them by alphabetical letters to avoid confusion. For this the following identification letters are used in this study.

<i>Sl. No.</i>	<i>Identifies as</i>	<i>Noted as</i>
1.	The territorial large male (Father tiger)	A
2.	The mother tigress	B
3.	The largest of cubs (Male)	C
4.	The second largest cub (Male)	D
5.	The third cub (Male)	E
6.	The fourth cub (female)	F
7.	The tigress which gave birth to two cubs in 1980 and 1982	G
8.	The Huge tiger appeared twice at Salghat	H
9.	First daughter of G of 1980 litter	I
10.	Second daughter of G of 1980 litter	J

The tigers H, I and J are comparatively of less importance as far as this study is concerned because they did not appear in the study area permanently throughout the study period.

The nucleus area between Sandhook khol, Phaphaphat, Ghanghar anicut and Salghat is of about 10 sq. kilometres in extent and there were the signs of occurrence of only two Tigers (viz. A) and B during 1977. They happened to mate during 1978 and the tigress gave birth to four cubs during April 1978.

In the early months of 1980 the young tigers seemed to try to adjust themselves, to establish in different territories, not on a might is right basis but in a more democratic way of adjustments, tolerance and give and take. Throughout 1980 all these tigers seemed to roam about in a divergent manner from the nucleus area in different directions, though boundaries of their areas of movement were not watertight. Also a tigress (G) with her two female cubs, which appeared to be of about 6 months, appeared adjacent to the nucleus area during December 1980. (G, I and J).

During the early months of 1981, the father Tiger A was missing from the scene. For so many months he was not located anywhere in the study area. The inference is that due to old age he must have become weak and either he must have moved to a safer area (safer from danger by even his own cubs) or he must have died due to weakness due to old age. Of course the direction of his movements was towards south west where probably he was much safer. Since this locality is adjacent to so many villages like Jamuntola, Kolegaon, Mohgaon he could have easily turned to cattle lifting. But no cattle lifting was reported in this area. Hence the inference that this Father Tiger A is dead, is emphasized.

The mother tigress B also had to face more or less a similar situation. Her cubs grew to their prime size and nature. She was also forced to select a safer territory warrenting less danger. Naturally she had to resort to a poor territory, poor from food and water point of view but better from shelter point of view for safety. Thus she withdrew herself to the north east hills of the nucleas area i.e. towards Salghat hill. This tigress was seen in May 1981, while driving through Salghat road near the ridge which happens to be the boundary between Kanha and Kisli Ranges. She looked much weaker than before reason being she was forced to move and live in that tract, a narrow belt of undulating hills, unable to come down to either side of the hill due to the danger from the young tigers. She had to live upon the occasionally available sambhar, wild boar and very rarely on spotted deer from the fringe of the adjoining territory.

Now it was up to the four young tigers and the tigress with two cubs, (C D E F G, and 2 cubs) to adjust themselves in the habitat. Largest of the cubs (C) felt the need of a better territory, better from food and water point of view and he did not care much for his own safety or shelter. He ventures to enter in the classic tiger territory near Kanha. Through Kanha ghat he reached Kanha meadows and selected the adjoining area towards east of Kanha. At present he occupies a class territory constituted by part of Kanha meadows, Lokadgadda road, Bijadadar and Chuhri in South east and link No. 7 in north east. Since this tiger entered from Kisli to Kanha the managers call him as *Kiska* Tiger for identification.

Tiger D (the second male cub) locally called as '*Langda*' (name due to a limp in right arm which healed after four weeks during November-December 1981) has got a very

vast territory in Kisli Range. This particular tiger D was seen mating with a tigress. (The tigress I in the study) Bandabohra about 7 kilometres south-east of Kisli and he prowls upto 3 kilometres north-west of Kisli, the average width of the prowling tract being 2.5 kilometres. The main abode was Phophaphat area between Kisli and Kopedabri where hundreds of tourists must have seen him by now. It was this tiger that was characteristically ferocious when he was a cub. The typical growling is a usual audio-feast to the Kisli dwellers every night. This tiger has got an exceptionally accommodative mentality with two tigresses which will be explained later. He occupies a sort of overlapping territory or rather covering territory in which two tigresses are also seen. But it has never happened that (excepting for the mating season) this tiger came in the way of tigresses prowling the area. When a tigress G with two cubs was in the nucleus area in 1983 which was better from food, water and shelter point of view, this gentle tiger used to move coolly from the scene. At this juncture, it has to be remembered that during 1976 one Tiger killed his own cub and partly ate also in Choochri near Kanha. With this in mind we must admire the broad mindedness of this very tiger. Langda Tiger is characteristically identified by the special Y mark near to his right eye. This tiger was seen mating with a tigress (Tigress I in the study group) on 23rd of November 1982. From morning they were in courtship till 4.30 in the evening. Then, surprisingly another tigress (Tigress J) appeared on the scene. Suddenly Tiger D left Tigress I and followed Tigress J in a mating mood. Such behaviour has been noticed in other mating tigers by other observers too.

Tiger E, the third male cub of the litter had to face altogether a separate mode of treatment from the wildlife managers. He was made the target of telemetry training for the wildlifers. He was tranquilised and radio collared on 12th of February 1980 when he was two year old. Prior to that as usual he was with the other cubs and mother tigress completing training to face the future hardships of life to come.

Radiocollaring was a mile-stone in his life especially in his selection of territory. For few months he was seen between Sandhook khol and Kapedabri. A characteristic feature was that he always resorted to the small hill tops and was never seen in the low-lying valleys. Further there was no evidence of occurrence of this tiger anywhere in the study area. We arrive at two inferences either or both of which must have happened. First the radio collar must have been in a non-functioning condition due to which the determination of his whereabouts became difficult. It may have happened that this tiger dispersed to the north west of the study area which happened to be the fringe of the park limited by villages like Khatia, Santia and Chappri. Anyway this is yet to be confirmed because no definite reports of this tiger's occurrence have been recorded.

The tigress F which is the sister of Tigers C, D and E found to be occupying a comparatively small territory towards east of the nucleus area. At times she reached up to

Kapedabri patrolling camp and for months together withdrew herself towards Jamutalab-Kudai-dadar area. She lives a much secluded life seldom exposing herself to view on the roads or to the tracking elephants. She was extremely shy even as a cub and used to move away from the trackers quickly.

Now Tigress G was seen near the nucleus area with two female cubs during November 1980. The cubs were of 6 months. These cubs have now adjusted themselves in different territories which will be explained later. These cubs were afterwards noted as I and J in the study. Tigress G was new for this area in 1980. She went, saw and conquered the area of Phaphaphat, Ghanghar and Sandhook khol. In her second litter she gave birth to four cubs in quite strange circumstances. During 1982, her cubs of 1980 litter were grown up and became independent. On 14th May 1982 this tigress G was seen beyond Ghanghar nala near Banada bohra about 2.5 kilometres north east of nucleus area. She was very weak. A porcupine quill got stuck into her cheek due to which she was unable to open her mouth. She was not able to drink or eat. Hence she was tranquilised, porcupine quill was removed and she was radiocollared. To our very pleasant surprise she gave birth to four cubs after 1.5 days. One cub died on the very same day. She shifted the three cubs to some remote area. Then she was not visible. Also she was not seen during the rainy season of 1982. She was again seen in December 1982 in the nucleus area. Pug marks of cubs were also seen. Finally she was seen with only two cubs in January 1983. She was continuously in the nucleus area till the end of this study. Now-a-days she occupies this best available area taking advantage of Langada's broad mindedness. With two cubs of one year age this tigress lives peacefully here.

For the sake of record a note has to be made of a huge tiger (Tiger H) who suddenly appeared before the elephants in Kherbadi-Solghat area one fine morning of February 1982. This quite strange Tiger was extra ordinarily ferocious. While trying to follow and track him among the bamboo growth, he used to shoot out from an unexpected direction towards the elephants as one assistant Mahawat who was only 18 years old tried to beat the Tiger out of fright with the stick in his hand from the elephant back. He was seen at another occasion also like this for a short while. It is inferred that while searching for a better territory, he came to this area and was quite upset to see elephants and trackers. So he must have withdrawn towards Siliaribohra—Sonf area due north of the nucleus area. He has never been seen again.

The list goes incomplete without the mention of tigresses J and I. There are two sister tigresses of the first litter of Tigress G of June 1980. They were first seen in the nucleus area along with their mother in November 1980, When these cubs matured they divergently moved from the study area because in study area there were so many young male tigers (Tigers C, D, E). One of these tigresses, J moved towards Chintapohar Dhawajhandi whereas the

Table showing predation proportion of six tiger units in the study area

Serial Number	Name Prey animal	Average meat wt. kg	Conversion to standard spotted deer wt.	No. required for isolated preda- tion per day	% of total predation	Food gained by wt. (kg)	No. of prey animals per day	Annual increase (No. required for one year)	Increase in number as per census between 1982 and 1983
1	2	3	4	5	6	7	8	9	10
1.	Spotted deer	18.00	1	3.55	58.00	27.84	1.54	562	957
2.	Wild boar	22.00	1.2	2.90	19.00	9.12	0.50	182	204
3.	Sambhar	44.00	2.44	1.45	13.00	6.24	0.35	127	95
4.	Bison	130.00	7.22	0.49	5.00	2.40	0.13	7	8
5.	Barking deer	4.00	0.22	16.00	1.00	0.48	0.02	7	13
6.	Peacock	3.50	0.19	18.28	2.00	0.96	0.04	14	63
7.	Jungle fowl	1.50	0.08	42.66	1.00	0.48	0.02	7	120
8.	Langur	2.00	0.11	32.00	1.00	0.48	0.02	7	381
						48.00 kg			

other (I) occupies a north eastern territory of Nabighati-Benipat, on 23rd November tigress I was seen mating with Tiger D at Banda bohra for the whole day. By evening Tigress J appeared on the scene and then tiger D was seen following Tigrers J, leaving tigrers I. Then on 19th December 1982, the tigrers J was seen mating with Tiger D at Banadabohra.

Thus we see the territorial tenures of different tigers in an area based on prey density and time factor. Although mention has been made of 10 different Tigers concentration was on only 7 different tigers (A, B, C, D, E, F, G) and two cubs which were in the study area.

Now it is worth assessing the predation proportion by Tigers in the study area for the study period. On an average a tiger in normal condition consumes 8 kilogrammes of meat a day Tiger A is dead and C went out of study area. Thus considering the 5 grown up tigers and two cubs (conveniently taking the total number as 6) in the study area should have a sustained production of $6 \times 8 = 48$ kilograms of meat daily. For studying the rate of predation, the prey availability has to be calculated. All prey quantity is converted to standard spotted deer by weight. The average meat weight of each prey animal assessed and then converted to standard spotted deer weight is given in the attached table (See Column No. 2, 3 and 4 of the table).

All the eight predator Tigers put together have to bring down any one unit of the prey animal or collectively they should have 64 kg of food from one or different prey animals daily. The isolated predations proportion and collective predation proportion will be clear from column No. 5 and column No. 7 of the table respectively.

But predation is essentially governed by the *availability and choice*. For this it is required to find out the percentage of each species of prey animal which is brought down by Tigers. In the study area it is seen that the percentage of predation over spotted deer is the maximum (58%) while that on jungle fowl, Barking deer and Langur is the minimum (1% each)—Column No. 6.

The day-to-day requirement of 8 Tiger units in the study area is met with in tune with this percentage, varying according to the change of prey animal. The quantitative and numerical requirement of each species is given in column No. 7 and 8 respectively.

From this daily requirement we can calculate the annual requirement of prey animals by number which has a bearing on the dynamics of population in the study area. See column No. 9 of the table attached.

Conclusion

Even though this study conveniently ignores other predators such as Panther, Wild dog, in an area where the Tiger is the dominant predator these calculations and assessments can help a lot in management. Because of the fact that this study was mainly concentrated on Tiger and his prey the other predators were not taken into consideration.

"Sheroo" The Corbett Park Man Eater

By

R.N. PANDEY

Deputy Director

On 15th of February 1984 Sri Subedar Ali, the Mahawat of Gomti (the forest department elephant of Corbett National Park), thought to go to bring the fodder from the Jungle lest his elephant might have remained hungry as her fodder cutter had gone to Ramnagar for some necessary work. He was attacked by the Tiger while he was cutting the fodder from a leaning Banyan tree (*Ficus bengalensis*) about 6-7 metres above the bed base of Chuipani sot but only 3-4 metres above from the other side of bank where there was a thickly wooded forest area with sal and rohani (*Mallotus philippinensis*). On the same side another tree was also leaning over the Banyan tree making a ramp like structure which facilitated the alleged Tiger to climb up and pull down the Mahawat. Sri Subedar Ali was attacked from behind and dragged about 5-6 metres away from the tree. His elephant was tied by a rope at the base of the tree (in depressed ground) and was very much frightened to see this unusual incidence. Subedar had screamed for help which was heard by another Mahawat, Sri Qutub, who was loading the fodder cut by him from another Banyan tree about 300-400 metres, a way from Subedar Ali. He immediately replied the call and came on his elephant to save Subedar who was struggling for his life with the large cat. As Qutub arrived the spot (after about 5-6 minutes), the tiger left Subedar Ali and sat down 2-3 metres. away watching them all. Subedar Ali had not lost his sense and his reflexes were still functioning. He rolled down to the feet of the Qutub's elephant and then crawled down about 5 metres in depression and opened the rope of his elephant. Subedar caught hold the ears of his elephant and asked his elephant to lift him up. The elephant did it and Subedar glided over elephant's back. Qutub's elephant was leading and Subedar's elephant was following and they started running back to Dhikala as both the elephants were frightened. The tiger also followed them up to about 1 km distance and than vanished. When Subedar reached Dhikala, it was about 2 P.M. He was still in senses and calling for help. His scalp had been completely and severely peeled off. One finger chewed up and a deep canine wound near the left ear with pinna damaged and also a number of uncounted deep laserated wounds and claw marks over his back, shoulders, arms and legs. Immediately he was taken to Ramnagar Hospital (about 50 km) where he was given first-aid and then to Kashipur hospital for intensive care and surgery as the case was very very serious. After about 10 days he was

taken to A.I.I.M.S. New Delhi where he was operated twice and now is supposed to be out of danger. Scalp grafting by plastic surgery will be done afterwards.

This was the second case of the said maneater nick named 'Sheroo'. The first victim was the late Mahesh Haward (also known as 'Kukku') a fodder cutter of Dhikala who was attacked by the same tiger 'Sheru' on 27th March 1982 in the same area about 2 km away from Dhikala near 'Chuiyani Sot' - a seasonal stream. As this was the second case of the said maneater, and that too in such a world renowned Park, it was decided to destroy or capture him as soon as possible because not only the tourists but the Park employees also were terrorised. Mahawats of the elephants were not daring to go far in the jungle and it had affected the diet of the forest department elephants of the Park because the good quality and sufficient quantity of green fodder was easily available only in the domain of the king of the jungle, 'Sheru'. Therefore, it was necessary to start operations for eliminating this menace. Keeping in view to lure the tiger a bait was put at the crossing of the Chuiyani and Kamarpatta road about 500 metres away from the place where Subedar had been mauled by the said man eater. On 16th this bait was found to be killed by one female with two cubs which on next day was joined by another female but none of the pugmarks of them resembled with that of man eater. A live bait was tied near Chuiyani Water hole also but this bait was not killed. The remaining portion of the bait killed by females and eaten up partially (on 15/16th night) was kept at the same spot on 18th February where Subedar Ali was mauled by tiger. On 22nd February the bait of Chuiyani waterhole was transferred to the place at the right bank of Chuiyani Sot, and was tied to a Rohani tree about 5 metres away from the Banyan Tree from where Subedar had been dragged by the maneater. On 23rd February when the staff went to inspect the spot the bait was found alive which of course discouraged the officials and also put a question mark before the success of operation. On 24th morning the bait was found to be killed and the pug marks taken near the kill were clearly indicative of the pug marks of 'Sheru' which also resembled with the pug marks of the tiger which had killed Howard about 23 months back. This success gave a new stimulus to the working spirit of staff. The cage was brought to the site and the bait killed by the tiger was allowed to be eaten up to lure the tiger and also to develop a sense of security while approaching the cage. As Sri C.B. Singh, the then Field Director of the Park, had to go to Lucknow to take over the charge as Chief Wildlife Warden, U.P. the job of catching of maneater was entrusted to me and Sri Brijendra Singh, who is Hon. Wildlife Warden and a frequent visitor of the Park. Sri Brijendra Singh is a real wildlife lover and keen observer also. He reached the site on 25th February at night and I reached there on 26th February in the afternoon. We both discussed about the future plan of operation and decided to continue baiting on the same spot (i.e. just at the right bank of Chuiyani Sot where Subedar had been mauled). We used to go to the site every morning at 8.30 A.M. and evening at about 5.00 P.M. to inspect the

spot and collect information. We could not find any evidence of the presence of maneater near or around the baiting site. During the day time myself and Mr. Singh used to go in different directions in the vicinity and around the Dhikala area to find evidence and gather information regarding the activities of the said culprit 'Sheru'. We studied many pug marks of various individual tigers inside the Park but could not reach any conclusion except that 'Sheru' was not present in the area of operation. On 28th afternoon, when I was coming back from Kanda I found pug marks resembling with that of 'Sheru' in Phulai Chaur which is opposite to Dhikala across the river, Ramganga.—These pug marks were directing towards Khinanauli (i.e. indicating the return journey of the tiger). I immediately told my staff that most probably 'Sheru' had come back to its territory after a long absence for it had gone on tour in its home range. The same was opined by Mr. Brijendra also. We were very much happy with this information and became almost sure that something is definitely going to happen on the next day. The bait was replaced by another one on 28th evening thinking that the first bait tied by us had already survived for 3 nights in open jungle and luck was favouring him so why not to try another one. This second bait was really very very unlucky for himself and tiger both but very lucky for us. On 29th morning when we visited the area we found that the bait was killed by Sheru on 28th night and dragged up to about 250 metres away across the Chuipani Sot and only one leg was eaten up. The pug marks near the baiting site were resembling with that of 'Sheru' and carcass was dragged towards the hill side which was a confirmed territory of 'Sheru'—the real menace of Dhikala. Meanwhile the tiger was declared as man eater by the Chief Wildlife Warden, U.P. and orders were issued to capture or shoot him immediately. However myself and Mr. Brijendra Singh were of the opinion to catch him alive and not to shoot as he had every right of appeal to let him also live. He was alleged for taking a toll of one life and mauling one person which were not so serious to prove him real man eater but these two evidences had upset the whole routine of the Park. Therefore we decided to trap him alive. We got the carcass dragged by the elephant and fastened it with the lever releasing rod (inside the cage) keeping the trap door open. One leg of the carcass was cut by knife and put in front of the door half inside out and the stomach was torn off and dung was sprayed over the ground around the cage to attract the tiger. The whole cage was camouflaged with green twigs of 'Mallotus' tree. This was done at about 10 A.M. on 29th February, 1984. When Sri Hira Singh, the Forest Guard, was trying to noose the neck of the carcass for dragging it by elephant, the tiger was growling nearby on uphill side at a distance of about 200 metres (though he was being guarded by us against the charge). In the evening Mr. Singh visited the spot at 4.00 P.M. but there was nothing new and I also inspected the site at about 6.00 P.M. but could not get any evidence of tiger though his presence in the vicinity was very well felt but untraced. We decided to visit the area next morning at about 8.30 A.M. It was 1st of March and we had to assemble at the crossing

of the Chuipani and Kamarpatta road as usual and then to move towards the cage. We were almost sure that if the Tiger does not come during night of 29th February/1st March, it was definite that it will not come again in the area at least for a week. We were very much optimistic and that's why I asked the Range Officer Mr. Nautiyal to take one manpacked wireless set and 4 elephants, Axes, Steel wires, Water bottle etc. etc. Sri Nautiyal was more optimistic than me and he carried his tape recorder also to record the voice of the culprit. We reached exactly at 8.30 A.M. at the crossing and as we saw each other we wished for good luck and started moving towards the cage. We were going examining the path if the tiger had gone away from the area but there was no such evidence which gave a new stimulus to our pulsation. We were still to cover about 200 metres to approach the cage when I heard some unusual sound for a fraction of a second. I conveyed my feelings to Mr. Brijendra Singh who was sitting on another elephant and he also gave a positive reply. After moving about 20 metres more every one of us heard a loud roar of tiger dashing the wall of the cage which was really a thrilling moment and unique opportunity for any one. In reply of the tigers roar our elephants started trumpeting and refused to go ahead. My elephant named 'Roopkali' was very brave and I took it in front of the tiger and saw its face for the first time. This was a very healthy tiger and massive in built. We got down from the elephant and myself and Brijendra Singh alongwith two forest guards (including the brave Heera Singh) went near the side of the cage sitting inside the Land Rover which seemed to be intolerable by the great 'Sheru' who was trying to break the cage and give us a lesson. We without wasting a single minute started tightening the joints of the cage by steel wires and thus securing and strengthening the cage more and more. He had broken one canine of right lower jaw before we reached on the spot. Immediately wireless message was sent to Headquarter Ramnagar via Dhikala to bring a truck and veterinary doctor. Doctor came but he was having only Pathidin (the anaesthetic drug), a derivative of Morphine, which we both felt not proper to be given to 'Sheru' as it might cause some system disorder or side effect. We were regretting for not having ketamine or other tranquilizing drug. I felt that when the tiger was openly seeing people around its cage it was irritated but was sitting calmly when left alone. I, therefore, asked my staff to bring tarpoline and cover the cage. This was done and it really helped us while loading the cage into the truck and even transporting also. We tried to give a suspension of sleeping pills in water through a plastic pipe but it was refused and the pipe was snatched by the tiger from Mr. Singh's hand and broken in to pieces. We ultimately poured some water from top of the cage and covered with tarpoline. The cage was loaded on the truck at about 3.30 P.M. and I alongwith staff started for Lucknow. During journey the night was pretty cold. So no water was given to the tiger during the journey but he was given some water at Lucknow at 9.30 A.M. On the 2nd of March 1984 he was transported to Kanpur Zoo because many tigers had died in Lucknow Zoo in the past and therefore, the Chief Wildlife Warden, Mr. C.B. Singh, advised to

keep it in a bigger enclosure which was available at Kanpur Zoo. It was unloaded at 5.00 P.M. in Kanpur Zoo and released first in squeeze cage and then into a bigger enclosure after having washed the wounds with a solution of Acriflevin powder. Now it has adjusted to the new surroundings.

Some Observations

1. Tigers certainly have a definite area which is defended by them from intruders and where they remain for most of the time. This area can be called as "Territory" but it is smaller in size and meant for its stay and food both.

2. Tigers have a bigger area also which is visited less frequently by them but not defended. This area can be called as 'Home Range' and is mainly meant for hunting/breeding purposes.

3. Tigers also demonstrate their power to frighten their enemy in various ways, e.g. Sheroo was demonstrating by breaking the bones of kill inside the cage when approached very close.

4. No tranquilizer is required during transportation if the animal is covered by some cloth because it feels secure as if it is inside its den and does not see the human being which may excite the animal.

5. Tigers may become man killer/cattle lifter without any deformity or disability in them (which is normally known as the main cause of that turning (towards man-eating) e.g. Sheroo was perfectly alright but probably it made its first kill by coming across accidentally (i.e. by chance) and later on it developed a taste of human blood.

Whatever may be the cause but we are happy that the punishment of death has been converted into a 'Life-Sentence',

Key-note Address delivered by Lt. Col. Fatesinghrao P. Gaekwad of Baroda, President, World Wildlife Fund-India and Life Member, Wildlife Preservation Society of India at the 33rd Annual PATA Conference held in Colombo, Sri Lanka, from April 2nd to 6th, 1984

I deem it a singular honour to have been invited to deliver the Key-note Address at this, the 33rd Annual PATA Conference. I am not sure whether the term 'Key-note Address' is fully appreciated by many. A modern dictionary explains it quite succinctly and simply as 'the main interest or determining principle of a Conference'. I take it that PATA organisers fully understood this before commanding my presence here today.

Some of you will recall that just under 2½ years ago, you did me a similar honour when at Manila in the November of 1981, you asked me to speak at the 'Second International Tourism and Heritage Conservation Conference' on the subject of "Tourism and the Conservation of our Natural Heritage". I tend to blush very easily, particularly when such compliments are heaped upon me and it is only my salt and pepper beard that somewhat saves me from displaying my happy reactions. Having said this, let me tell you that the tasks you have been imposing upon me have been quite rigorous and had it not been for the fact that I love and welcome challenges, I would have politely turned down both your invitations.

I must also thank PATA for giving me this opportunity of revisiting Sri Lanka, undoubtedly the most magnetic and dazzling jewel of the Indian Ocean. Here, as you know, Tourism has been approached in a pragmatic manner, resulting in high foreign exchange yields, but without doing much damage to the Natural Heritage. Let me come to the point and not beat about the bush, in case I flush a brace of partridge or raise a hornet's nest.

Tourism today has achieved a more significant and prominent position in the economic activities, of many countries. In some countries, it was a long and hard struggle before it was accepted as an industry. In some of these countries, it has reached the status of being the second largest exchange earner. Reasons for its rise to such an eminent position vary from country to country. Basically, however, tourism is based on attracting people both internationally and nationally by providing apparently monetarily painless pleasure and the methods used are far too many to enumerate. Today, only a handful of countries reap rich dividends from the tourist industry in areas directly connected with Conservation. Some others are only just waking up to the potential while others have suddenly realised the dangers caused to Conservation measures by letting the flood-gates open to Tourism without scientific planning, particularly in territories set aside for Conservation purposes.

It was not until as late as 1969 that at a Conference held in New Delhi that the IUCN (International Union for Conservation of Nature and Natural Resources) deemed it fit to come to grips with the problem and defined the term 'National Park'. I will not bore you by going into the details of the now accepted definition, save to draw your attention to the parts relevant to the subject of my talk.

A third part of the definition states that a National Park is 'where visiting is authorised, under certain conditions, for inspirational, recreative, educational and cultural purposes'. Then one of the five basic conditions for recognising an area as a National Park states 'visiting must be allowed, otherwise it is not a national park, but an integral reserve'. And finally, the definition covers perfectly the *three* motives which can guide the founders of a National Park:—

- 1) to oppose human exploitation in order to *conserve* eco-systems or landscapes;
- 2) to enable visitors to benefit in various ways (recreational, educational and cultural) from the success of this conservation;
- 3) to put this Conservation to use by allowing studies impossible elsewhere.

It might be interesting to note that nothing in the definition implies that any one of these three motives is more important than the other two. All three, of course, do involve problems for the setting up or continued existence of National Parks. To preserve an area free of human exploitation can conflict directly, and do, with powerful economic interests who may apply pressures for the opening up of important areas for the national economic good. And the second two aims—both to allow public access and to promote scientific study—quite often seem incompatible and this has led to a most important factor in National Park administration.

It is not easily recognised—even though it is so obvious—that there is a symbiotic relationship between tourism and environment—social, cultural and natural. It is for this reason that the impact of tourism on the environment is a matter of considerable importance and needs the attention of all concerned. For instance, sometimes it may happen that the very factors which attract the tourists may get affected adversely by the visits of a large number of tourists. This area needs therefore careful research to see how best the imperatives of environmental protection and the thrust of tourism can be balanced. For example, a pride of lions who have got used to the constant presence of human beings have had a human meal because the tourist imagined that they were so tame as to justify him getting out of his vehicle to go up and pet them! Scientists have come to the conclusion that over-exposure to human beings have affected the breeding patterns of some animals. Rhinos

have been found to take more interest in vehicles transporting humans than in their own mates and so on.

The impact of tourism on the environment is mainly due to the following reasons:—

(a) Establishment of tourism infra-structure may lead to an adverse impact on the environment. For example, the building of roads to hill stations necessitates cutting of the hill sides and felling of trees, which may ultimately bring about landslides and avalanches. Deforestation leads to erosion and siltation of rivers downstream etc.

(b) Tourism includes urbanization and unless there is concomitant growth in other infra-structural facilities, there can be serious problems of pollution. For instance, lack of attention to facilities like sewerage, drainage, waste disposal, etc. can, and have, led to pollution of the river systems and reservoirs.

(c) For narrow short term monetary gains, the construction of metallic roads and concrete monstrocities must obviously be discouraged and many obese tourists will certainly welcome a slightly bumpy ride as an excuse to lose weight or shake up the liver on the morning after the night.

There are enough on the role of tourism as an industry, the economic importance of tourism, etc. However, it does not seem that no serious studies have been conducted on the impact of tourism on the natural and social environment. This is, therefore, a priority area for attention in the future.

This is but one side of the coin. Nothing like 'Heads I win, tails you lose !' On greater introspection, however, it cannot but be recognised that ultimately the principle of 'sustained use' is the foundation on which tourism rests and this is the main plank of the 'Conservation Ethic' as well.

The 'Conservation Ethic' is today based on science and ecology. The promise is that of man-environment balance. The real way of achieving this balance is to lay emphasis on the protection of nature and natural resources. This has to be through the exercise of controls to prevent habitat destruction, habitat homogenization, reduction of species, and natural resources pollution.

Though it may appear to be a situation of conflict, in fact, the forces of Tourism and Conservation have developed many symbiotic characteristics—mutual benefit by functioning together.

Tourism interests complement conservation and recreation efforts in many ways. Tourist literature expounds the virtues of recreation activities in the out-of-doors—swim-

ming, fishing, hiking, boating and a host of others. Furthermore, it emphasises the social and personal value of recreation such as family togetherness (sadly lacking in urban areas), individual well-being and freedom from stress. The commercial side of tourism—hotels, restaurants, entertainment—offer services and products that recreationists seek. Furthermore, tourist elements—transportation, guided tours, literature—stimulate interest in the landscape, heightening access to and understanding of the environment, an important component of Conservation.

It seems also obvious that much of Conservation ideology and practice fosters tourism and recreation. Conservation, as a social value, is supported by the popularisation of the landscape by tourism and recreation interests. Conservation, in the sense of efficiency, is fostered by the geographic clustering tendencies of business enterprise, especially at transportation modes. Conservation, in its concern over aesthetics, plays directly into the hands of recreation and tourism, especially in support of protecting and making accessible both vast and intimate areas of outstanding scenic beauty. Conservation of plant and animal life is providing basic appeal to society to view and understand biology. Concerns over species elimination and pollution are highly complementary to the interests of tourism and recreation. Certainly, Conservation in the sense of cultural and heritage protection, restoration and interpretation, heightens people's interests—hence complements this form of recreation and tourism. Thus, it seems that the time is long overdue for greater understanding of the inter-relatedness, even synergism, of these forces among the land owners, planners, policy-makers, and managers. Policy-making in the area of synergism between tourism, conservation and recreation virtually does not exist today. Institutional boundaries do not generally allow interlacings between institutions, while each one has primary roles that are bound by function, by custom and even by law, there is need today for much broader policy-making. The purists, for example, who wish to designate parks for specific purposes are ignoring the facts both environmental and behaviour. No piece of land is completely homogeneous and people are not singular in their behaviour. Only parts of parks, may, at certain times, provide only parts of people's interests and activities.

Conservation areas are established for the *good of man*—the protection and management of resources to prevent abuses that would destroy them. Because they are a social good, they are supported by the public. Neither political nor social forces will allow destructions that will prevent their use. Integral to their use are many tourism and recreation components.

Agencies, organisations and other institutions are essential. These are the mechanism through which we operate. No one would suggest their abolition. However, when their vision and their mandates, and therefore, their programmes and accomplishments, are kept

within constrained boundaries, the result is fragmentation and lack of integration. Both the environment and society suffer as a consequence.

How beautifully does this self-styled superior being called 'Man' put it? Only today, and I don't think he has really fully realised that his megalomaniacal march, 'bestriding the world like a Colossus' has fully taken into account the importance of the role of his fellow creatures on earth in his own benefit. He now communicates to any parts of the world through the air, timewise, he can get to city A from city B, some times even before leaving city B; he has conquered space and has landed on the Moon and yet these so-called successes are the results of his cruel experiments on rabbits, rats and monkeys. Man knows how to get to the Moon, but he still does not know how birds and mammals annually migrate thousands of miles without the use of any man-made navigational instruments like the compass, the radar etc. Don't you think my carrier pigeon is more reliable than the modern postal service? I can go on and on speaking on this particular aspect, however, should I do so, it will only serve to detract from the main theme. As you know, I am deeply involved with the World Wildlife Fund, whose main concern is the saving of endangered species, which realises that if the true message of Conservation is not spread effectively and as quickly as possible, as time goes by, more and more species of plant and animal life will come under the definition of 'extinct' or 'threatened'. I am no George Orwell, nor a Prophet of Doom, but the rate at which Man is marching on 'regardless', mowing down his fellow creatures on this planet, he is suddenly going to find himself in confrontation with himself.

You are all an intelligent and shrewd lot and I am sure my message has already got to you loud and clear. I have not been leading you up the garden path, or on a wild-goose chase; on the contrary, I have indicated a direction which, if followed, may lead you to the goose that lays the golden egg!

The Conservationist, although he may not readily admit it, knows deep down in his heart that if Conservation is to be served through his National Parks and Game Reserves, he has to accept Tourism as an important and integral factor. Since it has to be a two-way traffic, and not as the Italians say 'senso unico', you must accept that the profits that you make from Tourism in Conservation areas will have to come only after you strictly adhere to the code of ethics laid down by the Conservationist. The Conservationist is an ultra-sensitive person who, the moment he feels that you might be even doing the slightest damage to his scientific and systematic plans, he will have no hesitation whatsoever in banning all tourist movement in his domains

Should most of what I have just said be acceptable to you and I do not see any reason why it should not, then I feel it is high time that the two of you got together and arrived at a

workable arrangement. Any further delay in implementing this is bound to lead to unnecessary confrontation. Unfortunately, at present, there appears to be no worldwide mechanism that can freely allow discussion and exchange of views on the interface of the forces of Tourism and Conservation. Both internationally, and nationally, there are separate organisations that identify with each of these fields. Occasionally, their scope includes discussion of the other approaches. Mainly, however, Conservation and park organisations do not include very important topics of recreation and tourism organisation. I must, therefore, congratulate PATA for initiating such a move. Obviously, it is the result of a growing feeling that some of your suggestions are meeting with resistance from park authorities and you are unable to understand why. While I deem it a great honour to have been selected by you to initiate this laudable and very necessary objective, I feel your choice could have fallen on somebody more eminent and vastly more knowledgeable. By your kind courtesy, I regularly receive your beautiful magazine which lists me as a 'Heritage Conservationist'. After this pathetic display of my talents today, I am not sure whether I will be redesignated or I will stop receiving your magazine!

Thank you.

Colombo, Sri Lanka,
April 5th, 1984.

Unique Method of Stalking its Prey by a Tiger (*Panthera tigris*)

By

PANE SINGH

Deputy Chief Wildlife Warden, Gulab Bagh, Udaipur-313 001

One evening in February, 1978 I was strolling in the Jhamra block of Darah Sanctuary near Kota. I saw a herd of nine sambar (*Cervus unicolor*) including two males grazing peacefully about 300 yards away. I trained my field glasses on them, but suddenly one of the sambar gave an alarm call and all of them herded together, heads up, ears turned forward, facing me. I thought they saw me but I was wrong. About 150 yards from me and the sambar there was a beautiful male tiger walking with a steady pace, unconcerned of the sambar. Here the jungle was quite thin with patches of scrub and interspersed trees. The jungle was dry deciduous.

The tiger took a complete circle fully exposed, the sambars belling and stamping their front hooves followed the tiger's movement. The tiger continued circling but gradually reducing the distance between him and the sambars. It seemed as if the tiger was drawing Laxman Rekha for sambars.

Leaving the scent trail around the herd and gradually reducing the distance the tiger confused the herd. The bewildered sambars did not try to run away, they simply churned round and round in the same place following the movement of the tiger.

The tiger on ninth round reduced the distance of its quarry to about 50 yards, then suddenly it ducked in a depression surrounded by some dense undergrowth. The movement was so quick that it looked as if the earth had swallowed the tiger. At this strange behaviour of the tiger rooted sambars remained there facing the depression for about five minutes. Then an old doe advanced towards the depression honking and stamping. After a pause of a few moments the herd also followed. Thus encouraged the old lady moved further with the rest of the herd close behind her. Just out of curiosity or to explore the position of the tiger the herd slowly moved towards the depression. When the distance between the position of the tiger and the herd was reduced to about 15 yards, the grand old pa with antlers thrown back, trotted ahead of the old lady probably to show his manliness. At the same moment the tiger shot out of its hiding place and took the stag off his guard. In no time the monarch of the glen was killed.

I have seen tigers stalking their prey on many occasions but the method adopted by this one was unique.

Are We Destroying Ourselves ?

By

BHUPESH MANGLA

16/5, Doctor's Lane, Gole Market, New Delhi-110 001

Among the various problems of Global importance, the problem of nature conservation is perhaps the most widely felt. It has been discussed widely and does need urgent steps to solve it. And if serious consideration about this matter is not undertaken, then this world may be facing a great danger, a danger even greater than that of nuclear weapons, in the near future !

Ever since the dawn of life on this earth, numerous species of plants and animals started living in different habitats. As a result of evolution one such species—Man, evolved to his present form. As man was a social animal he formed societies, civilizations and countries ultimately. In doing so, he cleared and destroyed numerous forests and natural habitats of various other species. Anyway, all this can be termed as inevitable because it was a necessary process.

But the sad fact remains that after man had successfully settled on the face of this earth, nearly half of the world's forest wealth had been destroyed. This continues today even and about 45 million acres of forests are destroyed every year. One may argue that forest wealth is one of the most important Natural Resources which can provide various useful raw materials for processing into finished goods. The basis of such an argument is only based on a very narrow perspective. The fact remains that man is destroying forests at a very alarming rate and even nature and Man cannot replace the lost wealth in time. It is always necessary to replace these resources by effective replantation etc., so that these resources stay renewable. Imagine, if the rate at which we are destroying these continues, till about 2000 A.D. we will be living on a barren earth. These forests are not only of industrial importance, but also of a great ecological and biological importance, as many of them form a natural habitat of numerous wildlife species.

And this in turn reminds me of the endangered wildlife of this world. It is almost alarming to note that the existence of some vital wildlife species has been completely wiped out, and many other face extinction. As the destruction of forests drastically affected the living conditions of these birds and animals, they are finding themselves squeezed and boxed into an area which is getting smaller day by day. Man had killed animals, primarily for food and other purposes in the past. But recently, Man has started killing wildlife just for 'Sport' or 'Game Hunting'. Many animals are killed for their costly skins, yet others are

killed for their useful parts. Elephants are extensively killed by greedy men in order to get their tusks, and the musk deer is sought for its invaluable musk. This form of hunting popularly known as 'poaching' has disrupted the harmonious lives of many a habitat.

It should be well understood that man is not the only Animal living on this Earth. All species of plants, birds and animals including Man, live on the basis of interdependence. Man is directly or indirectly depending upon many organisms for his ultimate survival. This can be illustrated with a very easy example. Man grows crops and other agricultural products in his fields, which in themselves are a natural habitat for various living animals. Now, it is a known fact that the rat population in a particular agricultural field must be kept in check, otherwise they may destroy useful crop. And this rat population is kept in check by snakes etc. If, out of fear, Man kills and destroys snakes, he is himself affected in the long run as the rat population increases alarmingly. Similar is the case with other wildlife species which are beneficial to Man in the long run.

India too faces a grave danger of declining wildlife as many birds like THE PINK HEADED DUCK, Himalayan Mountain Quail, Jerdon's Courser and Spotted Forest Owlet are already extinct. Many more including the great Indian Bustard and the white-winged wood duck are facing extinction. Among animals, the Indian Cheetah is already extinct and the Kashmir stag, Snow leopard, Asiatic lion, Indian wild ass and the Musk deer are facing extinction. In spite of knowing all these facts nobody seems to care.

It is high time that we realised the magnitude of this problem and acted accordingly. Organizations like the International Union for Conservation of Nature and Natural Resources (IUCN) and the World Wildlife Fund (W.W.F.) are already taking immediate steps in this direction but what is required is active participation on a still larger scale.

As the Youth today is the most dynamic and active strata of the present society, concrete plan of action and energetic efforts are to be formulated by the Youth. Various wildlife and nature conservation projects are being launched in the country and groups of young people can form voluntary organisations in order to support and propagate these campaigns. Visiting various Zoological Gardens and natural Habitats of endangered animals can also add a substantial amount to our present knowledge and talking to forest officials and naturalists can also guide us in the right direction. Who knows, concentrated efforts by the Youth may solve these gigantic problems in a matter of few years only. It is only a matter of realization and guidance among youth, who have a vast potential, ready to be tapped.

A Cruel Dilemma

By

PETER JACKSON

Zimbabwe is planning to reduce its elephant herds by 30 per cent over the next few years because of the recent severe drought and pressure on land from the growing human population. Vegetation has suffered so badly from the drought, and its potential for early regeneration is so reduced, that the government's wildlife specialists have decided that an initial cull of 6,000 elephants must be taken this year out of the total population of some 50,000. The long-term aim is to reduce the population to around 35,000, a figure considered to be within the carrying capacity of the land likely to be available for elephants in the foreseeable future.

The prolonged drought has been one of the worst suffered by southern Africa. Recently it was broken by heavy rains, but a senior Zimbabwe government scientist has declared, "The situation in most of the wildlife reserves remains critical. The level of rainfall, and therefore plant growth, is still well below that required to sustain game populations through the next dry season".

Zimbabwe's plans are bound to cause a shock at a time when there is an international outcry about ivory poaching and a decline in the number of elephants in many parts of Africa. It is indeed tragic, especially since Zimbabwe has the healthiest elephant population in Africa.

At the turn of the century hunting for ivory had almost wiped out elephants in most of southern Africa and only around 4,000 are believed to have roamed the wide open spaces of what is now Zimbabwe—then called Rhodesia. But by the beginning of this century laws were introduced to protect them and reserves were being established. In Rhodesia careful management has led to a 12-fold increase in the country's elephant population in the past 80 years.

But while elephants were increasing so were people, and present day Zimbabwe has a population of seven and a half millions—15 times the 1900 population—which is growing at a rate of 3-4% a year. There is great pressure on land and elephants and other wild animals will be lucky to retain their present 12% of Zimbabwe's area at the end of this century—only 16 years away.

Faced with this situation Zimbabwe's wildlife managers have decided that the elephant population has to be kept in check. Furthermore, experience has shown that elephant herds

confined to reserves and no longer at liberty to wander widely may destroy their habitat and food sources, resulting in starvation and a population crash.

The extensive Hwange (Wankie) National Park is a good example of the overall situation. Bordering the Kalahari desert, it is a dry dusty land, and in the past the waterholes filled during the rainy season and dried up in subsequent months. Elephant had to migrate. Management of Hwange involved making many of the waterholes perennial by installing pumps to bring up subsoil water. Elephants stayed throughout the year and bred in the favourable conditions so that there are now over 20,000 compared with 1,000 when the reserve was first established in the 1920s. Not only elephant flourished. Buffalo, impala, sable, roan, black rhino and re-introduced white rhino have all benefitted and combine to make Hwange a spectacular place to view wild Africa.

However, it is soon apparent to a visitor that Hwange is endangered by the abundant elephant herds. Stark tree skeletons litter the landscape, especially around the waterholes. Some areas look like deserted battlefields. Elsewhere bark hangs from the trunks of trees, still green with leaf but doomed to die. It may be exciting to watch elephants tearing down branches with their trunks, or bulldozing trees to the ground for the sake of some fruits or twigs. But in large numbers they may cause such destruction, that the time could come when there is no food for them. In the past herds could move to new pastures, but now expanding human populations have surrounded and encroached on the remaining wilderness and there is virtually no space left for elephants outside their present habitats.

Twenty years ago a similar situation was developing in Kenya's Tsavo East National Park, where growing numbers of elephants were destroying the trees. There was a long and bitter debate between advocates of culling and those who argued that it was a natural phenomenon and nature should be allowed to take its course. In the event the argument became academic as drought and a massive wave of poaching took the lives of thousands of elephants—over 16,000 according to some estimates—as well as rhino and other species. Since then poaching has continued to reduce elephant numbers in Tsavo and many other areas of Africa.

Elephant poaching has not been such a serious problem in Zimbabwe, and elephants flourished even during the bush war preceding independence in 1980. But now the drought has dramatized the potential threat of over-population and Zimbabwe's wildlife managers see no alternative to sacrificing individual elephants for the future benefit of the species. This year 4,000 elephants will be culled in Hwange, and some of the pumps providing perennial water are being switched off so that elephants are no longer attracted and the surrounding vegetation will have a chance to recover.

In the southern reserve of Gona-re-Zhou bordering South Africa the elephant population was reduced by culling last year by nearly one-third—from 7,000 to 5,000—because of the severity of the drought and the damage the herds were doing to their habitat. Great baobab trees, some of which have survived for 2-3,000—years a sobering thought—were being decimated. Now five hundred more elephants will be culled there. In the north of the county, along the southern shores of the Zambezi, up to 1,000 elephant will be culled in the Matusadona and Chizarira/Chrisa reserves, and 900 in the Zambezi valley between Kariba and Mupata Gorge.

Zimbabwe's wildlife scientists feel that culling is fully justified in the interest of both woodlands and elephants, not to speak of other species. They argue that damage to woodlands may well be irreversible by the time it is obvious—in some devastated areas of Tsavo there is still no regeneration after 20 years. And if regeneration does take place it can take much longer to produce a mature tree than an elephant.

Culling may be considered justified, but is not a pleasant task. In the words of a spokesman of the Department of National Parks and Wild Life Management, "Controlled culling by skilled teams involves shooting large chunks of the populations, which is not pretty. Entire family groups are eliminated by skilled marksmen in the numbers and areas in which reduction is necessary. It is unpleasant, but so are the alternatives - a return to *ad hoc* human predation and loss of control, or a *laissez-faire* approach with the risks of habitat destruction and massive numbers of elephants dying".

The culling produces ivory and hides, which are sold to benefit the national exchequer. Twenty-five per cent of the meat goes to local people near culling operations, and the rest goes to more distant markets. But all of this is considered to be a "windfall" or spin-off of elephant population control and not a justification. However, it does serve to soften the often hostile attitude of local people to wildlife reserves, which may have been their former hunting grounds, or even their home from which they have been moved. Wildlife managers say that poaching has noticeably diminished, and even virtually ceased in some areas where food and other products from wildlife have been provided from culling.

राष्ट्रीय उद्यान बान्धवगढ़ में वन्य प्राणी अवलोकन

लेखक : जी० डी० द्विवेदी

(सहायक संचालक, बान्धवगढ़ राष्ट्रीय उद्यान)

विन्ध्य के दक्षिणाञ्चल में स्थित बान्धवगढ़ राष्ट्रीय उद्यान वस्तुतः प्रकृति-प्रेमियों, पुरातत्व-अन्वेषकों, वनस्पतिविदों एवम् ऐतिहासज्ञों के लिए एक महत्वपूर्ण स्थल है। बान्धव, बन्धैनी, रामपुर, दण्ड भैरव, हनुमान मंच, शची, माया आदि 32 सुरम्य पहाड़ियों से गर्वोन्नत; चरण गंगा, दमनार, बनबेई, चमकुली आदि लघु नदियों की मृदु कलकल ध्वनियों से निनादित, अधिरोही साल वृक्षों के कंधों से कंधा मिलाते साजा, हल्दू, बीजा, कसई आदि उच्च वितानीय पादपों से परिपूर्ण; घास, बांस व अन्य तृणकों से संधानित; प्राचीन दुर्ग-देवालय तथा अनेक गुफाओं का वैभव समेटे; अनुपम नैसर्गिक छटाओं से सम्पूरित यह वनोद्यान निश्चिततः वन्य प्राणियों की क्रीडास्थली के सर्वथा उपयुक्त है।

बान्धवगढ़ राष्ट्रीय उद्यान का गठन वर्ष 1968 में किया गया। इसके पूर्व विगत 400 वर्षों से यह महाराजा रीवा के “निजी आखेट वन” के रूप में प्रयुक्त एवम् संरक्षित किया गया। स्वतंत्रता प्राप्ति के बाद, रियासतों के विलीनीकरण एवं पुनः राज्यों के पुनर्गठन के फलस्वरूप वर्ष 1956 में यह क्षेत्र म०प्र० शासन (वन विभाग) के अन्तर्गत आया। महाराजा रीवा के विशेषाधिकार सुरक्षित रहे, अंततः वन्य जीव संरक्षण में पूर्ण अभिरुचि रखने के कारण महाराजा रीवा ने इस क्षेत्र से अपने विशेषाधिकारों (शिकार सम्बन्धी) को हटाते हुए, इसे राष्ट्रीय उद्यान के रूप में गठित किए जाने का अनुरोध शासन के समक्ष रखा, फलस्वरूप मार्च 1968 में क्षेत्र को राष्ट्रीय उद्यान घोषित किया गया।

राष्ट्रीय उद्यान के रूप में विधिवत् गठित हो जाने के उपरान्त इस वन क्षेत्र में वैज्ञानिक नीतियों पर आधारित वन्य-जीव संरक्षण की नियमित प्राविधियाँ लागू की गईं।

यह वनोद्यान क्षेत्रफल में केवल 105 वर्ग कि०मी० होने के बावजूद, स्थलाकृतिक रचना के मनोहारी वैविध्य के कारण यथेष्ट वन्य जीवों के आकर्षण का केन्द्र बन सका है। बान्धव, बन्धैनी, रामपुर, गणेश आदि सुरम्य पहाड़ियाँ पूरे उद्यान क्षेत्र में सुवितरित हो कर विभिन्न वन्य प्राणियों के लिए अलग-अलग प्राकृतिक वासों का निर्माण करती हैं। इनकी वक्षस्थली से निसृत चरण गंगा, दमनार, चमकुली, बनबेई, राजबहरा, आमनाला आदि छोटी नदियाँ अपने सतत जल प्रवाह से उद्यान को हरा भरा बनाए रखने के साथ, तृषार्त वन्य जीवों की तृष्णा शान्त करने में अद्भुत योगदान प्रदान करती हैं।

पहाड़ियों के बीच-बीच मैदानी भागों में घने साल एवम् मिश्रित प्रजातियों के वन, उनके साथ

लगे हुए यत्र तत्र फैले दलदली चरागाह इस वनस्थली को अनुपम सौन्दर्य प्रदान करते हैं। प्रकृति सुन्दरी की देह्यष्टि से लिपटे परिधान पर बेल बूटों जैसे आकर्षक लगने वाले ये “वाद” (घास के मैदान) सांभर, चीतल, नीलगाय, चिक एवम् गौर आदि तृण भोगी वन्य जीवों के लुभावने स्थल हैं।

इलाहाबाद से 254, रीवा से 125, सतना से 115 एवम् उमरिया से मात्र 33 कि०मी० दूर स्थित होने एवम् लोक निर्माण विभाग की पक्की सड़क पर स्थित होने के कारण आने जाने में कोई असुविधा नहीं होती। निकटतम रेलवे स्टेशन उमरिया (द० पू०) रेल कटनो-बिलासपुर से जुड़ा हुआ है। निकटतम वायु सेवा जबलपुर से उपलब्ध हो सकती है।

पर्यटकों की आवासीय सुविधा के लिए पर्यटक वन विश्राम गृह, ह्वाइट टाइगर लाज एवम् महाराजा लाज के सुविधा पूर्ण कमरे उपलब्ध हैं।

पर्यटन हेतु फरवरी से 15 जून तक का समय सर्वोत्तम है। पाए जाने वाले वन्य जीवों का परिचय संक्षिप्ततः निम्न प्रकार है :-

1. शेर (Tiger) — दीर्घकाय, सुगठित, शानदार सुनहरे पीले शरीर पर पड़ी काली धारियों युक्त, मांस भोजी जीव शेर इस उद्यान का प्रमुख आकर्षण है। विभिन्न परिस्थितियों में अनुकूलन की अद्भुत क्षमता, सुदृढ शारीरिक सौष्ठव, विशाल पंजे, संकुचनशील नखर, तीक्ष्ण धार वाले दाँत, काँटेदार जिह्वा, रात के अंधेरे में भी देखने की अद्भुत क्षमता, दिन के प्रकाश में भी निगोपित (CAMOUFLAGE) करने की कला, शिकार पर आक्रमण करने में विजली सी फुर्ती आदि ऐसे अनेक गुण हैं जो शेर को मांस भोजियों की श्रेणी में सर्वोत्कृष्ट पद पर आसीन करते हैं।

वर्तमान में इस उद्यान के अन्दर इनकी संख्या 23 है जिन्हें चोर बहरा, जमुनिहा, कैतिकहा, चक्रधरा, राजबहरा, बाघ दलाका, बठान एवम् आंधयारी मझीरिया के क्षेत्रों में उपयुक्त समय पर भ्रमण के दौरान देखा जा सकता है। हाथियों द्वारा शेर देखने के लिए चोर बहरा एवं जमुनिहा सब से उपयुक्त व निकटवर्ती स्थल हैं।

2. तेन्दुआ (Panther) — छोटे कद, अद्भुत फुर्ती, गुलदार शरीर, पेड़ों पर सुविधा पूर्वक चढ़ सकने की पूर्ण क्षमता जैसे गुणों के कारण यह वनराज के क्षेत्राधिकार में भी अपना निर्वाह करता है। साथ ही वन से लगे हुए ग्रामीण सीमावर्ती क्षेत्रों में भी ताक-झांक करने में नहीं चूकता।

उद्यान में इनकी संख्या ज्यादा नहीं है। संभवतः शेरों के अत्याधिक घनत्व के कारण इन्हें परिस्थितियों से समझौता करते हुए अपना वास-स्थल परिवर्तित करना पड़ा है। बरुहानाला, जुड़मानी, चरण गंगा का तट, चोर बहरा तथा दमना की तरफ कभी कभी इनके दुर्लभ दर्शन होते हैं।

3. लकड़ बघा (Hyena) — मांस भोजी श्रेणी में बाह्य रूप से कुचा वंश, अन्य रचना में सिवेट-वंश तथा दंत-रचना में बिल्ली-वंश से मिलता जुलता, अभक्ष्य-भक्षी यह भ्लेच्छ जन्तु वनो-

द्यान की बाह्य सीमाओं से लगे हुए कथली, दमना, हरदिहा, महामन आदि क्षेत्रों में रात के समय देखा जा सकता है।

4. गौर (Gaur) — भीमकाय, गहरे बादामी या काले रंग का शरीर-आवरण किन्तु चारों पैरों का आधा हिस्सा (नीचे का) सफेद, चिकनी चमकदार सींगें, विशाल सिर, छोटी आँखें, भारी, मोटी और छोटी गर्दन युक्त तृण भोगी - सरल स्वभाव वाले ये जन्तु भुण्डों में चरते हुए या मंथर गति से विचरण करते हुए—‘सूखी’ ‘बहेरहा’ ‘सुवारी, राजबहरा’ ‘भद्राशिला’, चांदनी तथा चक्रधरा बाहों (Meadows) में आसानी से दिखाई पड़ जाते हैं। घास व बांस की पत्तियाँ ही इनका प्रिय भोजन है और ये दोनों ही वनस्पतियाँ यहाँ प्रचुर मात्रा में उपलब्ध हैं।

5. नीलगाय (Blue bull) — शारीरिक गठन में हिरण व गोवंश दोनों के लक्षण इस वन्य जीव में दिखाई पड़ते हैं। ये प्रायः खुले मैदानों में जहाँ थोड़ी बहुत झाड़ियाँ भी होती हैं—वास करते हैं। छोटे दलों में रहते हैं तथा आमा नाला मार्ग, दमना, मझखेता मार्ग, सूखी, बहेरहा, गोंदणी, सुवारी, राजबहरा आदि स्थानों में चरते हुए देखे जाते हैं।

6. सांभर — पथरीली पहाड़ियों, घने वनों में रहने वाला यह प्राणी बान्धवगढ़ वनोद्यान की वनस्थली को सर्वथा अपने उपयुक्त पाता है। पर्याप्त संरक्षण हो जाने के कारण इनकी संख्या में यथेष्ट वृद्धि हो रही है। दिन में घने मिश्रित वनों में छिपे रहने एवम् शाम को चरने के लिए खुले मैदानों में निकलने पर इनके भुण्ड के भुण्ड चक्रधरा, राजबहरा, बहेरहा, अधियारी, भीतरी, बठान आदि स्थलों में दिखाई पड़ते हैं। वस्तुतः इन्हें उद्यान के हर भाग में यत्र-तत्र देखा जा सकता है।

7. चीतल (Spotted deer) — छरहरा शरीर, पतली सुडौल टांगें, आकर्षक नेत्र, पतनशील शाखा युक्त बड़ी सींगों वाला - श्वेत धब्बेदार यह लुभावना हिरण यहाँ पर्याप्त संख्या में पाया जाता है। इनके बड़े-बड़े दल चक्रधरा, भीतरी, खोलिया, बठान, राजबहरा, सुवारी, चांदनी, कैतिकहा, भद्राशिला आदि अनेक स्थानों पर प्रातः सायं चरते हुए अत्यन्त सुगमता पूर्वक दिखाई पड़ते हैं। धूप होते ही यह घने बांस युक्त मिश्रित वनों में बैठ कर विश्राम करते हैं और पुनः चरने के लिए खुले भागों में आ जाते हैं।

8. चौसिंगा (Four horned antelope) — चार सींगों वाला, हल्के भूरे रंग का यह मृग घने वनों में वास करता है तथा अकेले या जोड़े में रहना पसन्द करता है। सीतामण्डप, भीतरी मार्ग, अधियारी मझीरिया, रामपुर पहाड़ी, घोड़ा डेमन, डोंडवा आदि स्थानों पर इन्हें यत्र-तत्र देखा जा सकता है।

9. चिकारा (Indian Gazelle) — ये भी मृग की तरह अत्यन्त सुन्दर प्राणी हैं। खुले मैदानों में घास चरते हुए जोड़े या छोटे दलों में दिखलाई पड़ते हैं। आँखों के सौन्दर्य के लिए चिक प्रसिद्ध है।

वसन्त ऋतु में सुवारीवाद के पास के खुले क्षेत्र में “कामोदीप्त नर” को अगले पैरों से ‘मादा’ की पिछली टांगों को मार कर “प्रस्ताव” करते देखा गया है। मादा के लिए नरों में कभी-कभी युद्ध छिड़ जाता है। हारने वाले नर अपना अलग दल बना कर रहने लगते हैं। उद्यान में इन्हें गोंहणी के पास के मैदानों, सरदूहा, महामन आदि क्षेत्रों में सुगमता पूर्वक देखा जा सकता है।

10. भासा या काकड़ (Barking deer) — अकेले या जोड़े में रहने वाला, घने वनों को पसन्द करने वाला यह हिरण, यहाँ काफी संख्या में पाया जाता है। सुनहरा वादामी शरीर, छोटी सींगें, लम्बी जीभ, फुदकने जैसी चाल सहज ही दर्शकों का मन आकर्षित कर लेती है। वन राज की उपस्थिति का आभास होते ही यह अपनी तेज सचेतक ध्वनि से आस-पास की वनस्थली को गुंजायमान कर देता है। चीतल, सांभर, लंगूर आदि अन्य प्राणी भी इसकी सचेतक ध्वनि से सचेत हो जाते हैं। चोर बहुरा, जमुनिहा, बघैनी, सिद्ध बाबा, भद्राशिला, भीतरी, कैतिकहा आदि अनेक स्थलों पर ये दिखाई पड़ते हैं।

11. भालू (Sloth bear) — दीर्घकाय, बलवान, बड़े-बड़े काले बालों से भरा शरीर, गोल सिर, लम्बा थूथन, छोटी आँखें, मोटी टांगें, मनुष्य के समान पैरों का तलवा रख कर चलने वाला यह ‘पदतलचर’ जीव वृक्षों पर चढ़ने में भी कुशल होता है। छेड़ छाड़ किये जाने पर अथवा अपने बच्चों के रक्षार्थ, यह बिना सोचे समझे घात करने को तैयार हो जाता है। सीधा खड़ा हो कर पहले वह मनुष्य के मुंह पर ही चिपटता है और अपने तेज नखों, दांतों से शल्य-क्रिया आरम्भ कर देता है।

दिन में इनके दर्शन दुर्लभ होते हैं। किन्तु रात को (विशेषतया ग्रीष्म में) ये आसानी से देखे जाते हैं। उद्यान के जिन भागों में महुआ वृक्षों की अधिकता है वहाँ ये महुआ फूल खाते दिन के समय (मार्च-अप्रैल) भी देखे जा सकते हैं।

12. लंगूर—वृक्षों पर निवास करने वाले, काले मुंह के लंगूर उद्यान के पूरे क्षेत्र में, अलग-अलग दलों में, विचरण करते देखे जाते हैं। ये दर्शकों का स्वागत अपनी उछल-कूद, तथा “हूप, हूस्प, हूस्प” से करते दृष्टिगोचर होते हैं। चीतलों के साथ इनका सह-जीवी सम्बन्ध यहाँ आसानी से देखा-परखा जा सकता है।

ऊपर वर्णित वन्य जीवों के अतिरिक्त इस उद्यान में आप “जंगली सुअर”, ‘जंगली कुत्ते’, भेड़िया ‘सियार’, ‘खरगोश’, विज्जू, अजगर, काला नाग गोह विष खोपड़ा, आदि अन्य जीव भी देख सकते हैं।

और हाँ ! पक्षियों के अवलोकन में गहरी रुचि एवम् आस्था रखने वाले पर्यटकों को भी यहाँ से निराश नहीं होना पड़ेगा। भाँति-भाँति के रंग बिरंगे पक्षी अपने सुमधुर कलरव से दर्शकों का मन मोह लेते हैं। वैसे तो एक सौ से अधिक प्रकार के पक्षी यहाँ पाए जाते हैं किन्तु सभी का उल्लेख

यहाँ न करते हुए कतिपय पक्षियों का नाम बतलाया जाता है जिन्हें आप अत्यन्त सुगमता से देख सकते हैं—सारस, मयूर, कई प्रकार के गिद्ध, चील, भाँति-भाँति के बाज, करांकुल, छोटा गरुण, धनेश, कई प्रकार के बक, दूधराज, भुजंगी, महोख, मुर्गे, तीतर, लावा, बटेर, मैना, टिटहरी, कई प्रकार के फाख्ता, सत मैय्या, उल्लू, तोता, महालत, किलकिला, हुद-हुद, कठफोड़वा, कबूतर, हरिचक, ओरियोल, फुलचुक्की, राबिन, खंजन, बीईटर्स, फुदकी आदि अपनी चहचहाहट एवम् रंग-विरंगे पंखों से आपको आकर्षित किए बिना नहीं रहेगी।

बिहंग-अवलोकन के लिए चरण गंगा का शीतल किनारा, भद्राशिला, चक्रधरा के दर्शक मंचान, भीतरी, राजवहरा आदि के जल युक्त मैदान तथा ग्रीष्म में चरण गंगा की उद्गम स्थली शेष शैय्या का शीतल सम्मोहक स्थल व किनारे के अन्य भाग निःसंकोच चुने जा सकते हैं।

अन्य आकर्षण—दो हजार वर्ष पुरानी गुफायें, ब्राह्मी लिपि में लिखे (गुफा-भित्तियों पर) प्राचीन शिलालेख, बान्धवगढ़ का प्राचीन दुर्ग, शेष शैय्या की विशाल मूर्ति आदि और इनके लिए आपको बाहर नहीं जाना होगा ये सभी प्राचीन गौरव चिन्ह आपके उद्यान के बीचों बीच दिखलाई पड़ जायेंगे।

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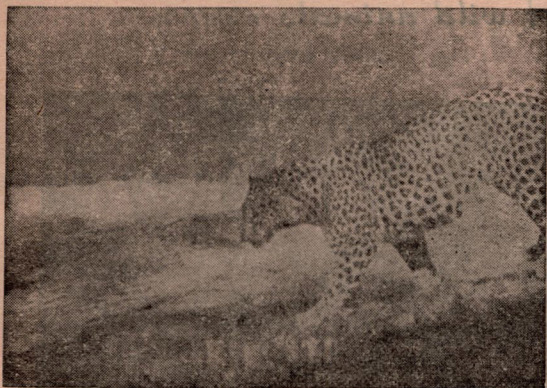
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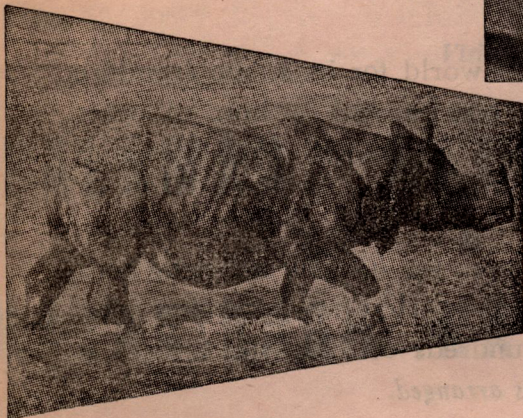
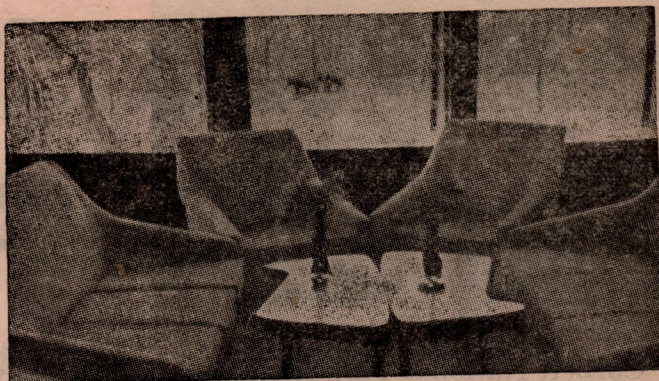
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